

***Site TRA-62 Track 1 Decision
Documentation Package,
Operable Unit 10-08***

September 2004

ICP/EXT-04-00588
Project No. 23415

Site TRA-62 Track 1 Decision Documentation Package, Operable Unit 10-08

September 2004

**Idaho Completion Project
Idaho Falls, Idaho 83415**

**Prepared for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
Under DOE Idaho Operations Office
Contract DE-AC07-99ID13727**

**DECISION DOCUMENTATION PACKAGE
COVER SHEET**

Prepared in accordance with

**TRACK 1 SITES:
GUIDANCE FOR ASSESSING
LOW PROBABILITY HAZARD SITES
AT THE INEEL**

Site Description: Abandoned Discharge Pipeline between the Building TRA-608 Area and Chemical Waste Pond TRA-701

Site ID: TRA-62

Operable Unit: 10-08

Waste Area Group: 10

I. SUMMARY – Physical description of the site:

Site TRA-62 is a pipeline located at the Test Reactor Area (TRA) of the Idaho National Engineering and Environmental Laboratory (INEEL). The site is located between Demineralization Building TRA-608 and Chemical Waste Pond TRA-701 (see Figure A-1, Appendix A). (Note: Chemical Waste Pond TRA-701 is alternatively referred to in INEEL literature as the Chemical Leach Pond (CLP) and Site TRA-06.) Discharge from this pipeline had three sources: Effluent from collection headers on both the west and southeast sides of Demineralization Building TRA-608 and effluent from the neutralization process in the Acid and Caustic Pump House Building TRA-631. A discharge line from the Acid and Caustic Pump House joins the 8-in. vitrified clay pipeline exiting on the west side of the Demineralization Building (see Figure A-2, Appendix A). This 8-in. clay pipeline continues south of TRA-608 approximately 30 ft, where it connects to a 12-in. vitrified clay pipeline at Manhole 28-C. A 6-in. vitrified clay pipeline exits the southeast side of the Demineralization Building and continues east approximately 50-60 ft. It then runs slightly southwest until it connects with the 12-in. pipeline at Manhole 28-C. The 12-in. pipeline then extends southeast from Manhole 28-C a distance of approximately 600 ft to Chemical Waste Pond TRA-701. This vitreous clay pipeline is single-walled with bell and spigot joints. This type of pipeline generally is made up of 12-ft sections that are placed together without necessarily sealing the joints. This was a common configuration for sewer pipelines in the 1950s and 1960s when this project was initiated. According to spoken communication with INEEL personnel, this pipeline transported from 2 to 3 million gal of effluent each year from 1962 to 1999.

In 1999, the east line was removed from service and capped, and the west line was cut and rerouted to the sanitary sewer system at Manhole 16-S. The portion of the pipeline still in operation carries only non-hazardous effluent.

There has been no sampling directly associated with the potential contaminants that may exist along Site TRA-62. Therefore, potential contamination must be inferred from other information. Sample analysis from the Chemical Waste Pond indicates the presence of Barium and Mercury at substantial levels and manganese, zinc, and arsenic at lower levels (see Table B-1, Appendix B.) These metals are by-products of the neutralization and demineralization processes that produced the effluent carried by the pipeline. There was one documented discharge event of mercury in 1995. Additionally, acidic and basic effluent was discharged through the pipeline prior to the early 1990s, at which time the pH discharge limits of greater than 3 and less than 11 were established. The probability exists that the pipeline was damaged or corroded over time by effluent outside these pH ranges. Therefore, effluent may have leached into the soil through damaged sections of pipe as well as the areas surrounding the pipeline joints.

DECISION RECOMMENDATION

II. SUMMARY - Qualitative Assessment of Risk:

Because Pipeline Site TRA-62 was constructed with older technology and transported 2 to 3 million gal of metals-contaminated acidic and caustic discharge water each year for approximately 40 years, it is recommended that soil samples be collected along the length of the pipeline to aid in assessing the remediation requirements of this site.

III. SUMMARY - Consequences of Error:

False negative error:

If sampling is not performed, or if no potential contamination is identified and remediated but still exists, contaminants from discharge pipeline TRA-62 potentially could expose individuals and the environment to contaminated soils or water for many years to come. Additionally, the possibility exists that potential contaminants could become mobilized by surface water and enter the Snake River Plain Aquifer.

False positive error:

If sampling of Site Discharge Pipeline TRA-62 is performed and contamination is identified and remediated but would not have posed a hazard to the environment or people, the funds spent on sampling and sample analysis would not be available for other remediation projects.

IV. SUMMARY - Other Decision Drivers:

Test Reactor Area is an active facility where the potential exists for current personnel to come into contact with contaminated materials and/or soils during construction and/or field activities. Additionally, should this area be opened to residential settlement within the next 100 years, results of soil sampling along Discharge Pipeline TRA-62 would prove whether or not metals contamination exists in this location.

Recommended Action:

Pipeline Site TRA-62 should be advanced to a Track 2 site allowing limited sampling to be conducted along the length of the line for metals. Results of these analyses would indicate proper future action—either to leave the pipeline as it is or to remediate the pipeline and surrounding soil.

Signatures: <i>Wendell Jolley</i>	# Pages: 24	Date: 9/28/04
Prepared By: <i>Wendell Jolley</i>	DOE WAG Manager:	
Approved By: <i>Michael Thelen</i>	Independent Review: <i>Donna Vandell</i>	

DECISION STATEMENT
(DOE RPM)

Date Received: 1/31/05

Disposition:

TRA-62 will be added to the release site list. The soil will be characterized and a final decision on disposition made using the New site Flow Chart agreed on in January 2005. Disposition will be documented in the DU 10-08 ROD

Date: 1/31/05

Pages: 1

Name: Kathleen E Hain

Signature: Kathleen Hain

DECISION STATEMENT
(EPA RPM)

TRA-62

Date Received: 11-2-04

Disposition:

EPA concurs that site TRA-62
Warrants further investigation and
should proceed to a track 2 site.

Date: 11-9-04

Name: DENNIS FANLLER

Pages:

Signature:

**DECISION STATEMENT
(STATE RPM)**

Date Received: November 2, 2004

Disposition:

TRA-62 Background and Recommendation

TRA-62 is the pipeline located between the Demineralization Building TRA-608 and the Chemical Waste Pond TRA-701. The pipeline is a single-walled vitreous clay line with bell and spigot joints (no sealant at the joints) originally designed to handle a waste stream of temporally highly varying (reportedly from 1 through 13) pH effluent. The effluent came from three sources and converged on TRA-62. These are collection headers from the west and southeast sides of the Demineralization Building TRA-08 (2), and effluent from the neutralization process in the Acid and Caustic Pump House Building TRA-631. These lines all converge on the 12- inch TRA-62 pipeline at "Manhole 28-C", which then continues the remaining 600 feet to Chemical Waste Pond TRA-701.

To date there has been no soil sampling associated with the potential contaminants that may exist along TRA-62. Sample analyses from the Chemical Waste Pond, the destination of the TRA-62 effluents, indicates the presence of barium and mercury at "high" levels, and lesser concentrations of manganese, zinc, and arsenic.

There is agreement with the Track 1 recommendation that a Track 2 investigation that includes soil sampling at intervals along the length of the pipeline be conducted at TRA-62. It is assumed that the extremes of pH known to have been characteristic of the effluents that flowed through TRA-62, and the lack of sealants at the joints, may have resulted in corrosion and subsequent leakage. In addition to the potential contaminants listed above, lead should be added. Lead, together with mercury, is a common contaminant of industrial grade sulfuric acid which was the acidic agent used at TRA-608.

Date: December 6, 2004

Pages:

Name: Daryl F. Koch

Signature:

Daryl F. Koch 12/06/04

PROCESS/WASTE WORKSHEET ID: TRA-62			PROCESS: Transport of wastewater through drainage pipes WASTE: Water from flushing resin beds in the process of demineralization of facility water
Col 1 Processes Associated With this Site	Col 2 Waste Description & Handling Procedures	Col 3 Description & Location of any Artifacts/Structures/Disposal Areas Associated with this Waste or Process	
Transportation of wastewater from Demineralization Building TRA-608 to Chemical Waste Pond TRA-701. Wastewater was from both demineralization and neutralization operations.	Water used to flush resin beds. Acidic beds were flushed with caustic water and caustic beds were flushed with acidic water. Water was mixed with the acidic and caustic agents. Additionally, it contained/carried the minerals removed from the resin beds in the flushing action. Each flush required approximately 30,000 gal of water, which was sent through Pipeline Site-TRA 62 to the Chemical Waste Pond. The demineralization process produces heavy metals as a byproduct, including mercury, barium and possibly chromium.	Artifact: ~600 ft of 6-, 8- and 12-in. diameter vitreous clay pipe direct buried between 6 and 7 ft below the soil surface. Location: Between the Demineralization Building TRA-608 and the Chemical Waste Pond TRA-701 (Federal Facility Agreement and Consent Order site TRA-06). Description: A discharge line from the Acid and Caustic Pump House joins the 8-in. vitrified clay pipeline exiting on the west side of the Demineralization Building (see Figure A-2, Appendix A). This 8-in. clay pipeline continues south of TRA-608 for about 30 ft where it connects to a 12-in. vitrified clay pipeline at Manhole 28-C. A 6-in. vitrified clay pipeline exits the southeast side of the Demineralization Building and continues eastward approximately 50-60 ft. It then runs slightly southwest until it connects with the 12-in. pipeline at Manhole 28-C. The 12-in. pipeline then extends southeast from Manhole 28-C approximately 600 ft to Chemical Waste Pond TRA-701. The ends of the discharge pipeline, which is no longer in use, have been grouted.	

PROCESS/WASTE WORKSHEET ID: <u>TRA-62</u>		PROCESS: Transport of wastewater through drainage pipes WASTE: Water from flushing resin beds in the process of demineralization of facility water			
Col 4 What Known/Potential Hazardous Substance/Constituents Are Associated with this Waste or Process?	Col 5 Potential Sources Associated with this Hazardous Material	Col 6 Known/Estimated Concentration of Hazardous Substances/ Constituents	Col 7 Risk-based Concentration (mg/kg)(HQ=1) ^a	Col 8 Qualitative Risk Assessment (hi/med/low)	Col 9 Overall Reliability (high/med/low)
Mercury and other metals Acids Bases	Soils contaminated with wastewater at pipe joints and perhaps at localized areas where the piping may have become corroded or been otherwise damaged by many years of use.	Arsenic, Barium, Chromium, Manganese, Mercury, and Zinc have been identified in sampling of the soils in trenches north of Building TRA-608 and in the Chemical Waste Pond. Therefore, it is assumed that these constituents may be found along the pipeline. Mercury samples in the Chemical Waste Pond were analyzed at .001 to .049 mg/L with an average of .007 mg/L.	.002 mg/L Hg	med	med

Question 1. What are the waste generation processes, locations, and dates of operation associated with this site?

Block 1 Answer:

Waste generation process: Wastewater in Pipeline Site TRA-62 consisted of water used to flush the resin beds from the demineralizer operation in Building TRA-608. Acidic beds were flushed with caustic (bleach) water and caustic beds were flushed with acidic water. Each flush required approximately 30,000 gal of water that carried the diluted sulfuric acid and/or diluted caustic agent, sodium hydroxide, in addition to the released minerals from the resin beds. Two to three million gal of water were used for this flushing process each year. In the early 1990s, the water was required to be neutralized to pH greater than 3 or less than 11. This eliminated the acidic and caustic condition of the water. A 4-in. PVC drain line connected the Acid and Caustic Pump House neutralization process in Building TRA-631 to the 8-in. drain line exiting on the west side of Building TRA-608 to dispose of the neutralized effluent. In 1995, the acid and caustic tanks were flushed and the action inadvertently released a slug of mercury into the drain line. This was reported as a spill and is referred to as the June 1995 mercury spill in some INEEL literature.

Location: An 8-in. vitrified clay pipeline exits on the west side of the Demineralization Building TRA-608. This 8-in. clay pipeline continues south of TRA-608 for about 30 ft where it connects to a 12-in. vitrified clay pipeline at Manhole 28-C. A 6-in. vitrified clay pipeline exits the southeast side of the Demineralization Building and continues eastward for approximately 50-60 ft. It then runs slightly southwest until it connects with the 12-in. pipeline at Manhole 28-C. The 12-in. pipeline then extends southeast from Manhole 28-C for approximately 600 ft to Chemical Waste Pond TRA-701. In 1999, the 8-in. pipeline from the west end of the building was rerouted southwest to Manhole 16-S where it tied in to the sanitary sewer system.

Dates of operation: The 12-in. pipeline was constructed in approximately 1962 and used through February 1999, when it was decommissioned. A portion of the 8-in. line remains in service from the west end of TRA-608 to the tie in with the sanitary sewer at Manhole 16-S. The remainder of the 8-in. line between this point and Manhole 28-C remains in place. The 6-in. pipeline on the southeast side of building TRA-608 was decommissioned in 1999. It remains in place with a grouted end. A grout plug was installed in the outfall of the 12-in. line at the Chemical Waste Pond when the Chemical Waste Pond was decommissioned in 1999. The Chemical Waste Pond was addressed under the FFA/CO and an engineered cover has been installed.

Schematic drawing #P-ST005-TRA-MISC-01, dated November 29, 2001 (Figure A-2, Appendix A) shows the locations of these pipelines. There are four versions of TRA Drawing #448547, "TRA Underground Piping Project, Sanitary Sewer and Cold Waste" that also show these pipelines. The original is dated March 1, 1995. Revision 1 is dated May 13, 1998. Revision 2 is dated January 15, 1999. Revision 3 is dated April 19, 2001.

Block 2 How reliable are the information sources? ☒ High ☐ Med ☐ Low (check one)
Explain the reasoning behind this evaluation.

The pipelines and their uses are documented in the *Project Close-out Report for Waste Area Group 2, Test Reactor Area*. This report describes the closure of the drain line, the capping of the Chemical Waste Pond, and the tying in of the west end pipe to the sanitary sewer system. The engineered drawings confirm the locations of the pipelines before the capping of the Chemical Waste Pond and indicate locations of the manholes where the east line was disconnected and the west line was connected to the sewer system.

Block 3 Has this INFORMATION been confirmed? ☒ Yes ☐ No (check one)
If so, describe the confirmation.

Current site operators confirm the locations of the pipes and their uses.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input checked="" type="checkbox"/> 6
Anecdotal	<input checked="" type="checkbox"/> 10,12	Documentation about data	<input type="checkbox"/>
Historical process data	<input checked="" type="checkbox"/> 11	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input checked="" type="checkbox"/> 4,5,8	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input type="checkbox"/>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input checked="" type="checkbox"/> 10	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> 11		

Question 2. What are the disposal processes, locations, and dates of operation associated with this site? How was the waste disposed?

Block 1 Answer:

Disposal processes: Three waste lines discharged into abandoned pipeline Site TRA-62 that transported wastewater to the Chemical Waste Pond.

Locations: Two pipelines originated from the TRA-608 Demineralizer Building, one from the west end and one from the southeast end of the building. The 8-in. vitreous clay pipeline from the west side of TRA-608 was rerouted to the sanitary sewer line at Manhole 16-S in 1999. The 6-in. diameter vitrified clay pipeline from the southeast end of TRA-608 connects to the 12-in. diameter discharge line at Manhole 28-C. It was grouted shut in 1999. A third line originated from Building TRA-631. The 12-in. pipeline Site TRA-62 runs approximately 600 ft from Manhole 28-C to Chemical Waste Pond TRA-701. It is a single-walled vitreous clay pipe that is direct buried between 6 and 7 ft below ground surface (per Phil Erickson).

Dates of operation: The abandoned pipeline Site TRA-62 operated between 1962 and 1999.

Waste disposed by: Wastewater was disposed via drains and sumps to the discharge pipeline and transported to the Chemical Waste Pond.

Pipeline Site TRA-62 is made of common bell and spigot joints that may or may not have been sealed. This may have allowed occasional discharge from the pipeline to the surrounding soil at various points throughout the useful life of the pipeline. The pipeline from the brine pit to the Chemical Waste Pond was flushed with water during the 90-day storage closure of the TRA-731A Brine Pit. The actions addressing closure of the TRA-731A Brine Pit were approved by the Idaho Department of Environmental Quality (DEQ) under Section 5.21 of the May 6, 1999 Notice of Violation (NOV) Consent Order. The drain line from the east end of TRA-608 to the connection with the 12-in. line served the east end/back end units of the demineralizer system. This line only managed non-hazardous effluent and was removed from service when a reverse osmosis demineralization system was brought on line in February/March of 1999. The drain line on the west end of TRA-608 served the west end of the demineralizer system and is still in service as a connection between TRA-608 and the sanitary sewer at Manhole 16-S. This line only manages non-hazardous effluent.

For a 44-day period from May to July 1995, approximately 287,100 gal of water containing 0.3 ppm of Resource Conservation and Recovery Act (RCRA) D009 hazardous waste, mercury (Hg), was discharged from the TRA-731A Brine Pit to the Chemical Waste Pond. This documented activity occurred during the closure of the Brine Pit Facility. The 1997 NOV and the 1999 NOV/Consent Order (CO) addresses this event.

Block 2 How reliable are the information sources? ☒ High ☐ Med ☐ Low (check one)
Explain the reasoning behind this evaluation.

The physical descriptions of the pipes were confirmed from the engineered drawings of TRA. S.D. Wilkinson confirmed the waste disposal procedures through the New Site Identification Form and the abandoned discharge lines documentation.

Block 3 Has this INFORMATION been confirmed? ☒ Yes ☐ No (check one)
If so, describe the confirmation.

The disposal operations are well documented.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input checked="" type="checkbox"/> 12	Documentation about data	<input checked="" type="checkbox"/> 6,2
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input checked="" type="checkbox"/> 4,5,8	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input checked="" type="checkbox"/> 9	Initial assessment	<input type="checkbox"/>
Summary documents	<input checked="" type="checkbox"/> 2	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> 10		

Question 3. Is there evidence that a source exists at this site? If so, list the sources and describe the evidence.

Block 1 Answer:

Yes, there is evidence that a source exists at this site.

List of sources: The source of the waste associated with this potential site has been identified as effluent from water demineralizer operations and associated neutralization of process water.

Evidence: Both buildings TRA-731A from the early 1960s and TRA-708C from the early 1980s were utilized as part of the TRA-608 Demineralizer System until February/March 1999, when the reverse osmosis system was brought on line. During this time, the drain line was not knowingly used to manage effluent containing hazardous wastes, with the exception of a short time between May and June 1995 (44 days). During this brief period, it is estimated that the line transported and discharged approximately <0.5 kg of materials containing RCRA hazardous wastes (D009, mercury) to the former Chemical Waste Pond. Although the source unit was addressed under the 1997 NOV/CO actions, no closure requirements were specified for the abandoned portion of the discharge line.

Secondly, and more importantly, during the evaluation of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site TRA-06 (Chemical Waste Pond) it was determined that most of the contaminants found to be present in the Chemical Waste Pond were transported to that location through this 12-in. pipeline. The *Final Record of Decision, Test Reactor Area, Operable Unit 2-13* indicates that approximately 80,000 grams of mercury have been released to the Chemical Waste Pond over the life of Pipeline Site TRA-62 (1962–1999). Complete source contaminant(s) identification and concentrations are not known at this time. However, it is known that some 100 million gal of water and low levels of sulfuric acid with associated contaminants plus minerals flushed from the local groundwater have passed through this pipeline and entered the Chemical Waste Pond. Soil binds with the minerals/metals and serves as a filter. Over time, the soil “filter” may collect metals in concentrations at hazardous levels. Given the drain line material and construction specifications (bell/spigot joints, vitreous clay, direct buried), there is reason to believe intermittent releases along the pipeline most likely occurred.

**Block 2 How reliable are the information sources? ☒ High ☐ Med ☐ Low (check one)
Explain the reasoning behind this evaluation.**

Neutralization and demineralization processes are known to have some heavy metal waste. Samples collected and analyzed from the Chemical Waste Pond contained heavy metals according to the OU 2-13 Record of Decision (ROD). Sulfuric acid is known to contain slight amounts of heavy metal contaminants.

Block 3 Has this information been confirmed? ☒ Yes ☐ No (check one)
If so, describe the confirmation.

The neutralization and demineralization processes are well documented. The OU 2-13 ROD and the sample analyses are available on the INEEL intranet database.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input checked="" type="checkbox"/> 6
Anecdotal	<input checked="" type="checkbox"/> 10,12	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input checked="" type="checkbox"/> 9	Initial assessment	<input type="checkbox"/>
Summary documents	<input checked="" type="checkbox"/> 2	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> 7		

Question 4. Is there empirical, circumstantial, or other evidence of migration? If so, what is it?

Block 1 Answer:

There is circumstantial evidence of migration of contaminants along Pipeline Site TRA-62. According to information detailed in the New Site Identification Form initiated by George Swaney, the pipeline that extends from Building TRA-608 southeast to the Chemical Waste Pond is composed of 12-in. vitreous clay pipe. This type of pipeline has connections between pipe sections that may not have been sealed. Pipes of this type were often fitted together at the connections without a sealant or clamps. In addition, it would be reasonable to assume some level of degradation to a vitreous clay pipe after 50 years.

Pipeline flow was induced by gravity pressure only. Without added pressure, there is no way to determine if all wastewater drained from the pipeline. Because some 80,000 grams of mercury migrated through the pipeline to the Chemical Waste Pond (according to the OU 2-13 ROD), the probability exists that some of the heavy metals are currently retained in or escaped through corroded portions or joints in the pipeline.

No samples have been collected to confirm or deny that the pipeline may have leaked.

**Block 2 How reliable are the information sources? ☐ High ☒ Med ☐ Low (check one)
Explain the reasoning behind this evaluation.**

The problems with vitreous clay piping are assumptions based on experiences and observations detailed in the New Site Identification Form.

**Block 3 Has this information been confirmed? ☐ Yes ☒ No (check one)
If so, describe the confirmation.**

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input checked="" type="checkbox"/> 6
Anecdotal	<input checked="" type="checkbox"/> 10,12	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input checked="" type="checkbox"/> 4,5,8	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input type="checkbox"/>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> 1,11		

Question 5. Does site operating or disposal historical information allow estimation of the pattern of potential contamination? If the pattern is expected to be a scattering of hot spots, what is the expected minimum size of a significant hot spot?

Block 1 Answer:

Site operating and disposal history: Since no analytical data is available, this pattern is based on leaks from pipelines with similar valves, connections, and material components.

Pattern of potential contamination: The obvious pattern would be along the pipeline, specifically adjacent and below it.

Hot spots: Hot spots would be located in the soils at the joints and connections or any compromised portion of the pipeline. Using site historical knowledge, each joint or connection would be considered to have a section of soil affected that is approximately 4 ft from the center of the joint or affected area in each horizontal direction and 4 ft deep for an estimated minimum size of 8 X 8 X 4 ft or 256 sq ft at each point of contamination.

Block 2 How reliable are the information sources? ☐ High ☒ Med ☐ Low (check one)
Explain the reasoning behind this evaluation.

This type of pipeline was widely used at the time of construction, and other sites have documented patterns of contamination.

Block 3 Has this information been confirmed? ☐ Yes ☒ No (check one)
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input checked="" type="checkbox"/> 12	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input checked="" type="checkbox"/> 4,8	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input type="checkbox"/>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> 11		

Question 6. Estimate the length, width, and depth of the contaminated region. What is the known or estimated volume of the source? If this is an estimated volume, explain carefully how the estimate was derived.

Block 1 Answer:

Pipeline Site TRA-62 is approximately 600 ft long and is most likely made up of 12-ft sections of vitreous clay pipe. Since no analytical data is available, the estimated dimensions are based on leaks from pipelines with similar connections and material components.

The known/estimated volume of the source:

The abandoned portion of Pipeline Site TRA-62 is 6, 8, and 12 in. in diameter and is approximately 600 ft long, extending from TRA-608 to the outfall at the Chemical Waste Pond. It is estimated that contamination leaked from each of the joints along the entire 600-ft length. The contamination most likely would not extend farther than 4 ft from the center of the pipe to each side and down. Figuring a portion of contaminated soil at each joint as 8 ft across, 8 ft long, and 4 ft deep, each joint could contain as much as 256 sq ft of contaminated soil. If each length of pipe measures 12 ft, the 600-ft pipeline would contain 50 lengths of pipe with 50 joints. Fifty joints at 256 sq ft of contaminated soil would result in approximately 12,800 sq ft of contaminated soil. Should there be additional compromised portions of pipeline with added leakage, the resultant volume would be greater.

This estimate was derived:

As stated above.

Block 2 How reliable are the information sources? ☐ High ☒ Med ☐ Low (check one)
Explain the reasoning behind this evaluation.

This contamination pattern is assumed from similar processes and physical orientation of this site in comparison with other known contaminated pipeline at the INEEL.

Block 3 Has this INFORMATION been confirmed? ☐ Yes ☒ No (check one)
If so, describe the confirmation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input checked="" type="checkbox"/> 7,10
Anecdotal	<input type="checkbox"/>	Documentation about data	<input checked="" type="checkbox"/> 9
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input checked="" type="checkbox"/> 8	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input checked="" type="checkbox"/>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> 11		

Question 7. What is the known or estimated quantity of hazardous substance/constituent at this source? If the quantity is an estimate, explain carefully how the estimate was derived.

Block 1 Answer:

The estimated quantity of hazardous substance/constituent at this source is <133 mg/kg of mercury and <3,830 mg/kg of barium. These are the contaminants of concern (COCs) in the Chemical Waste Pond as stated in the OU 2-13 ROD.

The estimate was derived:

At this time, a complete list of the potential COCs is not known. Section 5.2.1.2 of the OU 2-13 ROD states that barium and mercury are the primary COCs for the Chemical Waste Pond based on a sampling event in 1990. Since a completed evaluation of the drain line and its surrounding soils has not been performed, it is impossible to state that barium and mercury are the only potential COCs at this site. Although the calculated amount of mercury transported through this drain line into the Chemical Waste Pond is approximately 80,000 grams as stated in the OU 2-13 ROD, the amount of mercury and other possible COCs remaining in Pipeline Site TRA-62 are unknown at this time. Based upon the estimated amount of known contaminants deposited in the Chemical Waste Pond from this drain line, further investigation into the possibility of and potential adverse affects from any releases to human health and the environment is warranted.

Section 5.2.1.2 of the OU 2-13 ROD states that barium and mercury are identified as the two principal COCs for the Chemical Waste Pond. This was determined from 1990 sampling data. In the last paragraph on page 5-6 of the ROD it is noted that "the total mass of mercury contained in the Chemical Pond from all past disposal operations is estimated to be approximately 8.0E+07 mg," and that "the mercury contribution from the 1995 release is relatively small and is not expected to increase human health or ecological risk at the site." A measurement of 8.0E+07 mg is the equivalent of 80,000,000 mg or 80,000 g or 80 kg of mercury. The estimated release of mercury that occurred in 1995 from the TRA-731 tanks was <500 g or <0.5 kg. Thus, during the life of the Chemical Waste Pond, 1962 to 1999 (i.e., 37 years of service), 80 kg of mercury was discharged through the transfer lines from TRA-608 to TRA-701. This volume averages to approximately 2.15 kg of mercury discharged on an annual basis with one additional slug of mercury, <0.5 kg during a 44-day period in May to July of 1995.

When CERCLA Site TRA-06 Chemical Waste Pond was originally identified, the transfer pipelines should have been investigated/identified as part of that site or submitted for consideration as a separate site. The Site TRA-62 pipeline was the principal mechanism for transfer of contaminated waste water to the Chemical Waste Pond and the configuration/construction of the transfer line presents a potential for releases to the environment throughout its run.

Block 2 How reliable are the information sources? ☒ High ☐ Med ☐ Low (check one)
Explain the reasoning behind this evaluation.

Physical processes and contamination of the Chemical Waste Pond are well documented.

Block 3 Has this INFORMATION been confirmed? ☒ Yes ☐ No (check one)
If so, describe the confirmation.

Previously cited documentation confirms the information.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input checked="" type="checkbox"/> 6,2
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Historical process data	<input checked="" type="checkbox"/> 1	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input checked="" type="checkbox"/> 9	Initial assessment	<input type="checkbox"/>
Summary documents	<input checked="" type="checkbox"/> 2	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> 3		

Question 8. Is there evidence that this hazardous substance/constituent is present at the source as it exists today? If so, describe the evidence.

Block 1 Answer:

It is known that hazardous substances/constituents (i.e., mercury, barium, and possibly other metals) were detected in the Chemical Waste Pond. See the OU 2-13 ROD page 5-6. Pipeline Site TRA-62 carried the effluent that discharged into the pond and no record exists of any attempt to flush or drain this pipeline.

The evidence: Data from the Chemical Waste Pond and the TRA-56 and TRA-60 sites.

Exposure pathway: Potential exposure pathways associated with the Pipeline Site TRA-62 include inhalation, ingestion, and absorption through direct contact with the materials currently left in the pipeline or from contact with soils into which leakage may have occurred. Because the physical configuration of the line is a single-walled vitreous clay pipe with common bell and spigot joints, it is possible that materials containing the previously identified hazardous wastes (mercury, other metals, acids, and bases) may have been released to the soil at multiple locations throughout the run of the line.

Additionally, from 1962 to the early 1990s, there is a possibility that wastewater was discharged that was outside the pH range of greater than 3 and less than 11. In the early 1990s, discharge limits were established in the Operations and Maintenance Manual (O&MM) that required neutralization of wastewater to meet these more restrictive discharge limits.

This pipeline is no longer active. No evidence exists that effluent was flushed from the pipeline, thus removing contaminants remaining inside. Until the system is pressurized and the outflow sampled, the assumption that contamination is present is appropriate.

**Block 2 How reliable are the information sources? ☐ High ☒ Med ☐ Low (check one)
Explain the reasoning behind this evaluation.**

The information sources for this Track 1 assessment include individual conversations with appropriate Site personnel and INEEL documentation pertaining to Site TRA-62 and associated sites. The information has seemed quite reliable but direct sampling of the area would be much more reliable and accurate.

**Block 3 Has this INFORMATION been confirmed? ☒ Yes ☐ No (check one)
If so, describe the confirmation.**

Many individuals involved with the assessment of this Track 1 document have agreed independently with the information presented in this form. Additionally, this form is based on information taken directly from current INEEL documentation.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	<input type="checkbox"/>	Analytical data	<input checked="" type="checkbox"/> 6
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	Q.A. data	<input type="checkbox"/>
Photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input checked="" type="checkbox"/> 4,8	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input type="checkbox"/>
Summary documents	<input checked="" type="checkbox"/> 2	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> 11		

REFERENCES

1. DOE, *Track 1 Sites: Guidance for Assessing Low Probability Sites at the INEL*, DOE/ID-10340 (92), Rev. 1, U.S. Department of Energy, Idaho Field Office, July 1992.
2. DOE, *Final Record of Decision, Test Reactor Area, Operable Unit 2-13, Idaho National Engineering and Environmental Laboratory*, DOE/ID-10586, December 22, 1997.
3. DOE, *Project Close-out Report for Waste Area Group 2, Test Reactor Area*, INEEL/EXT-03-00028, Rev. 0, Idaho National Engineering and Environmental Laboratory, September 2003.
4. Friesz, R. A., "TRA Underground Piping Project: TRA Sanitary Sewer and Cold Waste," Drawing No. 448547 (Sheet 2 of 8), original and revisions 1, 2, and 3, dated March 1, 1995–April 19, 2001.
5. GIS Drawings, "TRA-62 Pipeline," Originator Dan Mahnami, 2003.
6. INEEL Environmental Data Warehouse.
7. Lopez, L., "Environmental Operations Sample Logbook," Logbook No. ER-50-01, dated April 26, 2001, pp. 25–30.
8. Portage Environmental, Schematic *INEEL TRA Site Tank-005 System Identification Support Information*, TRA Demineralizer Area Chemical Waste Disposal Piping Plan.
9. RCRA 1997 Notice of Violation - Violation #95 to 12, "Failure to Report Releases to the Environment from the TRA-731A Brine Pit to the TRA CLP."
10. Rowsell, David, Dewayne King, John McQuaray, and George Swaney, personal conversation, June 2004.
11. Wilkinson, S. D., "Abandoned Discharge Lines, TRA-608 Area to TRA-701 Chemical Leach Pond (TRA-62)," New Site Identification (Form 435.36), March 13, 2002.
12. Swaney, George, to Riena Carroll, personal conversations, July and August 2004.

Appendix A

Figures

- **Figure A-1: Map showing the location of Test Reactor Area and Discharge Pipeline Site TRA-62**
- **Figure A-2: Schematic P-ST005-MISC-001 (Engineering Drawing) of Site TRA-62.**

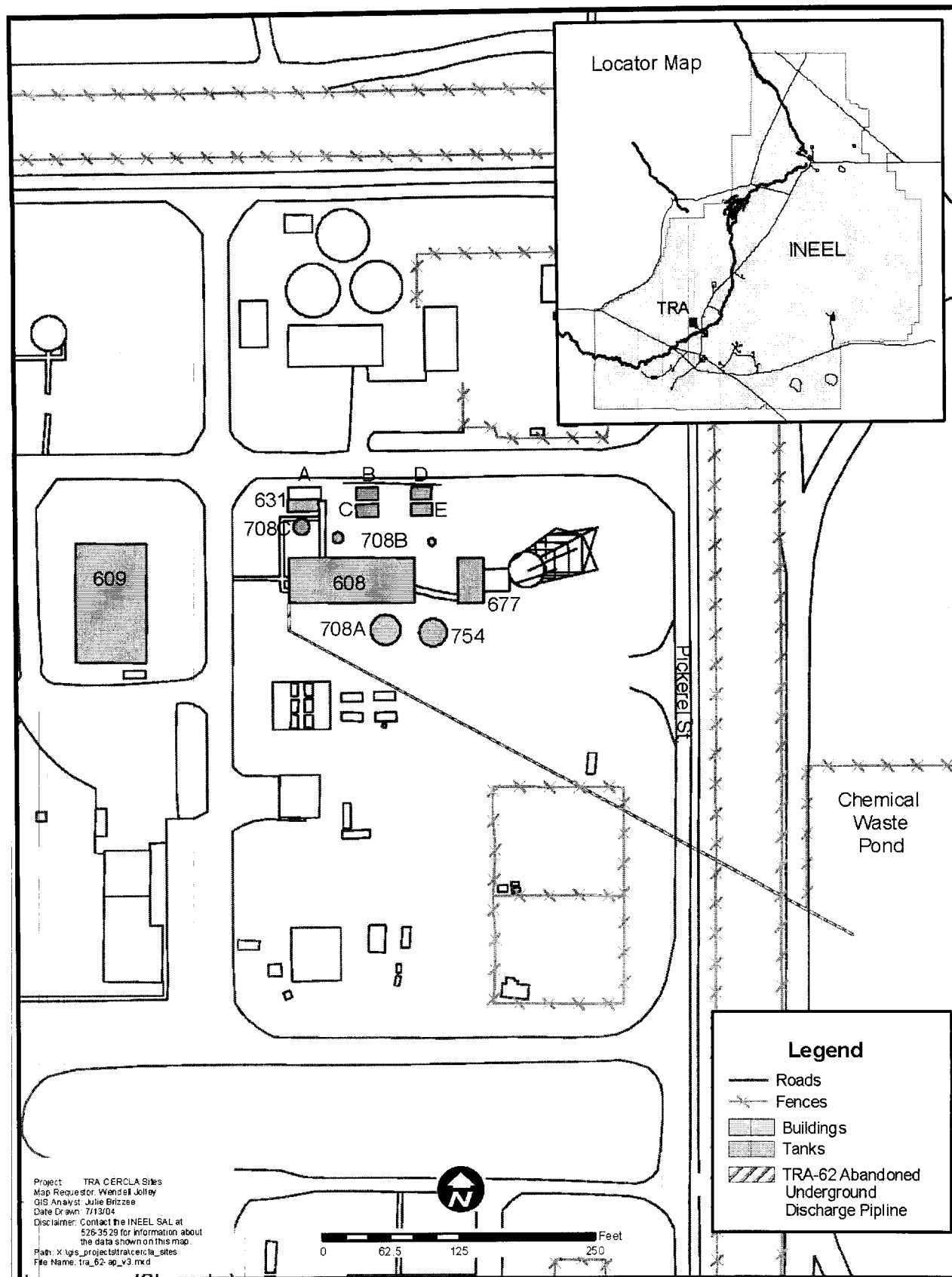


Figure A-1. Location of Test Reactor Area and Discharge Pipeline Site TRA-62.